

SEQUENCE LISTING

<110> HEMEBIOTECH A/S

<120> PRODUCTION OF rhPBGD AND NEW THERAPEUTIC
METHODS FOR TREATING PATIENTS WITH ACUTE INTERMIT-TENT
PORPHYRIA (AIP) AND OTHER PORPHYRIC DISEASES

<130> 23725PC1

<160> 22

<170> FastSEQ for Windows Version 3.0

<210> 1

<211> 5446

<212> DNA

<213> Homo sapiens

<400> 1

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| accagaggagc | ttgaacatgc | cctggagaag | aatgaagtgg | acctggttgt | tcactccttg | 240 |
| aaggacatgc | ccactgtgct | tctcctggc | ttcaccatcg | gagccatctg | caagcgggaa | 300 |
| aacctcatg | atgctgttgt | ctttcaccca | aaatttgttg | ggaagaccct | agaaaacctg | 360 |
| ccagagaaga | gtgtgggtgg | accagctccc | ctgcgaagag | cagcccagct | gcagagaaag | 420 |
| ttcccgcatc | tggagttcag | gagtatctcg | ggaaacctca | acacccggct | tcgggaagctg | 480 |
| gacgagcagg | aggagttcag | tgccatcatc | ctggcaacag | ctggcctgca | cgagcatgggc | 540 |
| tggcacaacc | gggtgggggca | gatcctgcac | cctgaggaat | gcattgtatgc | tgtggggcagc | 600 |
| ggggccttgg | gcgtgggaat | gcagcccaag | gaccaggaca | tcttggtatct | ggtgggtgtg | 660 |
| ctgcacgact | ccgagactct | gcttcgctgc | atcgctgaaa | gggccttctc | gagggcactg | 720 |
| gaaggaggct | gcagttgtgc | agttagccgtg | catacagcta | tgaaggatgg | gagcgtgtac | 780 |
| ctgactggag | gagctctggg | tctagacggc | tcagatagca | tacaagagac | catgcaggct | 840 |
| accatccatg | tccctgcccc | gcattgaagat | ggccctgagg | atgaccacca | gttggttaggc | 900 |
| atcactgctc | gtaacattcc | acgagggccc | cagttggctg | cccagaacct | gggcatcagc | 960 |
| ctggccaact | tgttgctgag | caagaggacc | aaaaacatcc | tggatgttgc | acggcaattg | 1020 |
| aacgatgcc | attaa | | | | | 1035 |

<210> 6

<211> 1035

<212> DNA

<213> Homo sapiens

<400> 6

| | | | | | | |
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| atgagagtga | ttcgcgtggg | taccgcgaag | agccagcttg | ctcgcataca | gacggacagt | 60 |
| gtggtggcaa | cattgaaagc | ctcgtaccct | ggcctgcagt | ttgaaatcat | tgctatgtcc | 120 |
| accacagggg | acaagattct | tgatactgca | ctctctaaga | ttggagagaa | aagcctgttt | 180 |
| accagaggagc | ttgaacatgc | ctcggagaag | aatgaagtgg | acctggttgt | tcactccttg | 240 |
| aaggacatgc | ccactgtgct | tctcctggc | ttcaccatcg | gagccatctg | caagcgggaa | 300 |
| aacctcatg | atgctgttgt | ctttcaccca | aaatttgttg | ggaagaccct | agaaaacctg | 360 |
| ccagagaaga | gtgtgggtgg | aaccagctcc | ctgcgaagag | cagcccagct | gcagagaaag | 420 |
| ttcccgcatc | tggagttcag | gagtatctcg | ggaaacctca | acacccggct | tcgggaagctg | 480 |
| gacgagcagg | aggagttcag | tgccatcatc | ctggcaacag | ctggcctgca | cgagcatgggc | 540 |
| tggcacaacc | gggtgggggca | gatcctgcac | cctgaggaat | gcattgtatgc | tgtggggcagc | 600 |
| ggggccttgg | gcgtgggaat | gcagcccaag | gaccaggaca | tcttggtatct | ggtgggtgtg | 660 |
| ctgcacgact | ccgagactct | gcttcgctgc | atcgctgaaa | gggccttctc | gagggcactg | 720 |
| gaaggaggct | gcagttgtgc | agttagccgtg | catacagcta | tgaaggatgg | gcaactgtac | 780 |
| ctgactggag | gagctctggg | tctagacggc | tcagatagca | tacaagagac | catgcaggct | 840 |
| accatccatg | tccctgcccc | gcattgaagat | ggccctgagg | atgaccacca | gttggttaggc | 900 |
| atcactgctc | gtaacattcc | acgagggccc | cagttggctg | cccagaacct | gggcatcagc | 960 |
| ctggccaact | tgttgctgag | caagaggacc | aaaaacatcc | tggatgttgc | acggcaattg | 1020 |
| aacgatgcc | attaa | | | | | 1035 |

<210> 7

<211> 1034

<212> DNA

<213> Homo sapiens

<400> 7

| | | | | | | |
|-------------|-------------|-------------|------------|-------------|-------------|------|
| atgagagtga | ttcgcgtggg | taccgcgaag | agccagcttg | ctcgcataca | gacggacagt | 60 |
| gtggtggcaa | cattgaaagc | ctcgtaccct | ggcctgcagt | ttgaaatcat | tgctatgtcc | 120 |
| accacagggg | acaagattct | tgatactgca | ctctctaaga | ttggagagaa | aagcctgttt | 180 |
| accagaggagc | ttgaacatgc | cctggagaag | aatgaagtgg | acctggttgt | tcactccttg | 240 |
| aaggacatgc | ccactgtgct | tctcctggc | ttcaccatcg | gagccatctg | caagcgggaa | 300 |
| aacctcatg | atgctgttgt | ctttcaccca | aaatttgttg | ggaagaccct | agaaaacctg | 360 |
| ccagagaaga | gtgtgggtgg | aaccagctcc | ctgcgaagag | agcccagctg | gcagagaaag | 420 |
| ttcccgcatc | tggagttcag | gagtatctcg | ggaaacctca | acacccggct | tcgggaagctg | 480 |
| gacgagcagg | aggagttcag | tgccatcatc | ctggcaacag | ctggcctgca | cgagcatgggc | 540 |
| tggcacaacc | gggtgggggca | gatcctgcac | cctgaggaat | gcattgtatgc | tgtggggcagc | 600 |
| ggggccttgg | gcgtgggaat | gcagcccaag | gaccaggaca | tcttggtatct | ggtgggtgtg | 660 |
| ctgcacgact | ccgagactct | gcttcgctgc | atcgctgaaa | gggccttctc | gagggcactg | 720 |
| gaaggaggct | gcagttgtgc | agttagccgtg | catacagcta | tgaaggatgg | gcaactgtac | 780 |
| ctgactggag | gagctctggg | tctagacggc | tcagatagca | tacaagagac | catgcaggct | 840 |
| accatccatg | tccctgcccc | gcattgaagat | ggccctgagg | atgaccacca | gttggttaggc | 900 |
| atcactgctc | gtaacattcc | acgagggccc | cagttggctg | cccagaacct | gggcatcagc | 960 |
| ctggccaact | tgttgctgag | caagaggacc | aaaaacatcc | tggatgttgc | acggcaattg | 1020 |
| aacgatgcc | attaa | | | | | 1035 |

| | | | | | | |
|-------------|------------|------------|------------|-------------|------------|------|
| tgacagcatcc | cgagactctg | cttccgtgca | tcgctgaaag | ggccttctctg | agggcactgg | 720 |
| aaggaggctg | cagtgtgcca | gtagccgtgc | atacagctat | gaaggatggg | caactgtacc | 780 |
| tgactggagg | agtcctggag | ctagacggct | cagatagcat | acaagagacc | atgcaggcta | 840 |
| ccatccatgt | ccctgccag | catgaagatg | gccttgagga | tgaccacag | ttggtaggca | 900 |
| tcactgctcg | taacattcca | cgagggcccc | agttggctgc | ccagaacttg | ggcatcagcc | 960 |
| tgggcaactt | gttctgtagc | aaaggagcca | aaaacatcct | ggatgttgca | cggcaattga | 1020 |
| acgatgccca | ttaa | | | | | 1034 |

<210> 8

<211> 1035

<212> DNA

<213> Homo sapiens

<400> 8

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|------|
| atgagagtga | ttcgcgtggg | taccgcgaag | agccagcttg | ctcgcataca | gacgggcagt | 60 |
| gtgggtggcaa | cattgaaagc | ctcgtaccct | ggcctgcagt | ttgaaatcat | tgctatgtcc | 120 |
| accacagggg | acaagattct | tgatactgca | ctctctaaga | ttggagagaa | aagcctgttt | 180 |
| accagaggag | ttgaacatgc | cctggagaag | aatgaagtgg | acctgggtgt | tcactccttg | 240 |
| aaggacctgc | ccactgtgct | tcctcctggc | ttcaccatcg | gagccatctg | caagcgggaa | 300 |
| aacctcctatg | atgctgttgt | ctttcaacca | aaatttgggtg | ggaagaccctg | agaaaccctg | 360 |
| ccagagaaga | gtgtgggtggg | aaccagctcc | ctcgcaagag | cagcccgact | gcagagaagg | 420 |
| ttcccgcatc | tgaggttcag | gagtattcgg | ggaaacctca | acaccgcgct | tcggaagctg | 480 |
| gacgacgacg | aggagttcag | tgctcatcct | ctggcaacag | ctggcctgca | gcgcattggg | 540 |
| tgggcacaacc | gggttgggca | gatcctgcac | cctgagggaat | gcattgatgc | tgtagggcag | 600 |
| ggggccttgg | gcgtgggaagt | gcgagccaag | gaccaggaca | tcttggatct | ggtgggtgtg | 660 |
| ctgcacgac | ccgagactct | gcttcgctgc | atcgctgaaa | gggccttctc | gagggcacctg | 720 |
| gaaggaggct | gcaggtgtcc | agtagccgtg | catcacagcta | tgaaggatgg | gcaactgtac | 780 |
| ctgactggag | gagctgtggag | tctagacggc | tcagatagca | tacaagagac | catgcaggct | 840 |
| accatccatg | tcctcgccca | gcataagat | ggccttgagg | atgaccacaca | gttggtaggc | 900 |
| atcactgcctc | gtaaacattcc | acgaggggccc | cagttggctg | cccagaactt | gggcatcagc | 960 |
| ctggccaact | tgttgcttag | caaggagacc | aaaaacatcc | tggtatgtgc | acggcaattg | 1020 |
| aacgatgcc | attaa | | | | | 1035 |

<210> 9

<211> 1035

<212> DNA

<213> Homo sapiens

<400> 9

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|------|
| atgagagtga | ttcgcgtggg | taccgcgaag | agccagcttg | ctcgcataca | gacggacagt | 60 |
| gtgggtggcaa | cattgaaagc | ctcgtaccct | ggcctgcagt | ttgaaatcat | tgctatgtcc | 120 |
| accacagggg | acaagattct | tgatactgca | ctctctaaga | ttggagagaa | aagcctgttt | 180 |
| accagaggag | ttgaacatgc | cctggagaag | aatgaagtgg | acctgggtgt | tcactccttg | 240 |
| aaggacctgc | ccactgtgct | tcctcctggc | ttcaccatcg | gagccatctg | caagcgggaa | 300 |
| aacctcctatg | atgctgttgt | ctttcaacca | aaatttgggtg | ggaagaccct | agaaaccctg | 360 |
| ccagagaaga | gtgtgggtggg | aaccagctcc | ctcgcaagag | cagcccgact | gcagagaagg | 420 |
| ttcccgcatc | tgaggttcag | gagtattcgg | ggaaacctca | acaccgcgct | tcggaagctg | 480 |
| gacgacgacg | aggagttcag | tgccatcctc | ctggcaacag | ctggcctgca | gcgcattggg | 540 |
| tgggcacaacc | gggttgggca | gatcctgcac | cctgagggaat | gcattgatgc | tgtagggcag | 600 |
| ggggccttgg | gcgtgggaagt | gcgagccaag | gaccaggaca | tcttggatct | ggtgggtgtg | 660 |
| ctgcacgac | ccgagactct | gcttcgctgc | atcgctgaaa | gggccttctc | gagggcacctg | 720 |
| gaaggaggct | gcaggtgtcc | agtagccgtg | catcacagcta | tgaaggatgg | gcaactgtac | 780 |
| ctgactggag | gagctgtggag | tctagacggc | tcagatagca | tacaagagac | catgcaggct | 840 |
| accatccatg | tcctcgccca | gcataagat | ggccttgagg | atgaccacaca | gttggtaggc | 900 |
| atcactgcctc | gtaaacattcc | acgaggggccc | cagttggctg | cccagaactt | gggcatcagc | 960 |
| ctggccaact | tgttgcttag | caaggagacc | aaaaacatcc | tggtatgtgc | acggcaattg | 1020 |
| aacgatgcc | attaa | | | | | 1035 |

<210> 10

<211> 1034
 <212> DNA
 <213> Homo sapiens

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 accacagggg acaagattct tgatactgca ctctctaaga ttggagagaa aagcctgttt 180
 accaaggagc ttgaacatgc cctggagaag aatgaagtgg acctgggttg tcaactcttg 240
 aaggacctgc ccaactgtgt tctctctggc ttaccatctg gagccatctg caagcgggaa 300
 aacctctcatg atgctgtgtg ctttcaccca aaatttggtt ggaagacctt agaaaccttg 360
 ccagagaaga gtgtggtggg aaccagctcc ctgcgaagag cagcccgagt gcagagaaa 420
 ttcccgcatc tggagttcag gaggattcag ggaaacctca acaccggctc tcggaaagctg 480
 gacgagcagc aggagttcag tgccatcacc ctggcaacag ctggcctgca gcgcattgggc 540
 tggcacaacc ggggtgggca gatcctgcac cctgaggaaat gcatgtatgc tggggccag 600
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 ctgcacgacg ccgagactct gcttctgtgc atcgctgaaa gggccttctt gaggcacctg 720
 gaaggaggct cgaagtgtgc agtagccgtg catcacagcta tgaaggatgg gcaactgtac 780
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 atcaactgctc gtaacattcc acgagggccc cagttggctg cccagaactt gggcatcagc 960
 ctggccaact tgttctgtgag caaaggagcc aaaaactctc tggatgttgc acggcaatta 1020
 acgatgccca ttaa 1034

<210> 11
 <211> 1035
 <212> DNA
 <213> Homo sapiens

<400> 11
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 accacagggg acaagattct tgatactgca ctctctaaga ttggagagaa aagcctgttt 180
 accaaggagc ttgaacatgc cctggagaag aatgaagtgg acctgggttg tcaactcttg 240
 aaggacctgc ccaactgtgt tctctctggc ttaccatctg gagccatctg caagcgggaa 300
 aacctctcatg atgctgtgtg ctttcaccca aaatttggtt ggaagacctt agaaaccttg 360
 ccagagaaga gtgtggtggg aaccagctcc ctgcgaagag cagcccgagt gcagagaaa 420
 ttcccgcatc tggagttcag gaggattcag ggaaacctca acaccggctc tcggaaagctg 480
 gacgagcagc aggagttcag tgccatcacc ctggcaacag ctggcctgca gcgcattgggc 540
 tggcacaacc ggggtgggca gatcctgcac cctgaggaaat gcatgtatgc tggggccag 600
 ggggcttgg gcgtggaagt gcgagccaag gaccaggaca tcttggatct ggtgggtgtg 660
 ctgcacgacg ccgagactct gcttctgtgc atcgctgaaa gggccttctt gaggcacctg 720
 gaaggaggct cgaagtgtgc agtagccgtg catcacagcta tgaaggatgg gcaactgtac 780
 ctgactggag gagtctggag tctagacggc tcagatagca tacaagagac catgcaggcc 840
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 atcaactgctc gtaacattcc acgagggccc cagttggctg cccagaactt gggcatcagc 960
 ctggccaact tgttctgtgag caaaggagcc aaaaactctc tggatgttgc acggcaattg 1020
 aacgatgcc cttaa 1035

<210> 12
 <211> 3988
 <212> DNA
 <213> Homo sapiens

<400> 12
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 tgacgcctac acttgccagc gccctgtagc ccgctccttt cgttttcttc ccttctcttc 120
 tgcacagctt cgcgcgcttt gccctgcaag ctctaaatgc ggggctcctt ttggggttgc 180
 gatttagtgc ttacgcgcac ctgcacccca aaaaacttga ttagggtgat ggttcacgta 240

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|------|
| gtggggccatc | gcccctgatag | acgggtttttc | gcccctttgac | gttgaggatcc | acgtttcttta | 300 |
| atagttggact | cttgttccaa | actggaacaa | cactcaaccc | tatctcggtc | tattcttttg | 360 |
| atttataagg | gattttgccc | atttcggcct | atttggttaa | aaatgagctg | attttaacaa | 420 |
| aattttaacgc | gaatttttaac | aaaataatata | cgcttacaat | tccatctcgc | cattcaggct | 480 |
| gcgcgaactgt | tggggaaggcc | gatcgggtgcg | ggcctctctcg | ctatttacgc | agctggcgaa | 540 |
| agggggatgt | gctgcaaggc | gattaaagtgt | ggtaacgcca | gggtttctccc | agtcacgacg | 600 |
| tgttaaaaag | acggccagctg | aattgtaata | cgactcacta | tagggcgtaat | tggtgtaccgg | 660 |
| gccccccctc | gaggtcgacg | gtatcgataa | gcttattaat | gggcatcggt | caattcgccgt | 720 |
| gcaacatcca | ggatgttttt | ggctcctttg | ctcagcaaca | agttggcgat | cgctagcccc | 780 |
| aagtctctggg | cagccaactg | gggcccctcgt | ggaatgttac | gagcagtgat | gctcaccaae | 840 |
| gtggggctcat | ccctcagggcc | atcttcatcg | tgggcaggga | catcgctggt | agcctgcagt | 900 |
| gtctctctgta | gtctatctga | gcgctctaga | ctccagactg | ctccagctcag | gtacagttgc | 960 |
| ccatctctca | tagctgtatg | cacggctact | ggcacactgc | agcctccttc | caggtgcctc | 1020 |
| aggaaggccc | tttcagcgat | gcagcgaagc | agagctctgg | gatcgctcag | caacaccacc | 1080 |
| agatccaaga | tgctctggtc | cttggtctcgc | acttccacgc | ccaaggcccc | ctggccccaca | 1140 |
| gtcgaggccag | tggttgccag | gatgatggca | tgcccaaccc | gggttggtcca | gccccagcgc | 1200 |
| agccgggtgt | atctctcagg | gtgcaggatc | ctgaactcct | gctgctcgct | cagcttccga | 1260 |
| agctggggctg | ctgtgtttcc | cgcaataact | ctgaactcca | gatcgctggaa | cttctctctgc | 1320 |
| aggggtcttcc | ctcttcgcag | ggagctgtgtt | ccaccaccac | tcttctcggt | cagggtttctt | 1380 |
| cagatggctcc | cgatgggtgaa | cacaggaggga | agcacagctg | catgagctgg | ttccccgtct | 1440 |
| acaaaccaggt | ccacttcatt | cttctccagg | gcatgttcaa | gctctctggt | caaggagtgta | 1500 |
| ttctctccaa | tcttagagag | tcctagatga | agaaactctg | ccccctgtgt | aaacacagct | 1560 |
| atgatctcaa | actgcaggcc | agggtaacag | gctttcaagt | tgccaccacc | actgtccgtc | 1620 |
| tgatgtcgag | caagtctggt | cttgcgggta | ccacgcggaa | tcaactctcat | actgtctctgc | 1680 |
| agcccggggg | atccactagt | tctagacggg | ccgcacacgc | ggtagagctc | cagcttttgtt | 1740 |
| tccttttagt | gaggggttaat | tcctagacttg | gcgtaatcat | ggtagagctc | gcttctctgt | 1800 |
| tgaatttggt | atccgctcac | aattccacac | aacatacag | ccggaaagcat | aaagtgttaa | 1860 |
| gctctgtggt | ctctaagtgt | gcgttaactc | acattaattg | cggtgcgctc | actgcccctg | 1920 |
| ttccagtcgg | gaaacctgtc | gtgccagctg | cattaatgaa | tcggccaaacg | cgccggggagc | 1980 |
| ggcggtttgc | gtattggggc | ctcttccgct | tccctgcgct | ctgactcgct | cgctctggct | 2040 |
| gttcggctcgc | ggcgagcggg | atcagctcac | tcaaaggcgg | taatacgggt | atccacagaa | 2100 |
| tcaggggata | acgcaggaaa | gaacatgtga | gcaaaaagcc | agcaaaaagc | caggaaacgt | 2160 |
| aaaaaggccg | cggtgtctgg | gtttttccat | agggctcgcc | ccccctgacg | gcatcacaaa | 2220 |
| aatcgacgct | caagtccagag | gtggcgaaac | ccgacaggac | tataaagata | caggcgtctt | 2280 |
| ccccctggaa | gctccctcgt | gcgctctcct | gttccgacat | tgccgcttac | cggataccctg | 2340 |
| tcgcctcttc | tccttctcgg | aagcgttgccg | ctttctcata | gctcacgctg | taggttatctc | 2400 |
| agttcggtgt | aggtcggttcg | ctccaagctg | ggctgtgtgc | acgaaccccc | cgttcagccc | 2460 |
| gcacgctcgg | cccttatccg | taactatcgt | cttgagtcga | acccggtaag | acacagctta | 2520 |
| tcgcactcgg | cagcagccac | tggttaacag | attagcagag | cgaggtatgt | agggcggtgt | 2580 |
| acagagtctc | tgaagtgtgt | gcctaactac | ggctacacta | gaaggacagt | atttggatct | 2640 |
| tgcgctctgc | tgaagccagt | taccttcgga | aaaagagttg | gtagctctct | atccggcaaa | 2700 |
| caaaaccacc | ctgggtacgg | tggttttttt | gtttgcaagc | agcagatctac | gcgcagaaaa | 2760 |
| aaaggtactc | aagaagatcc | tttgatcttt | tctacggggg | ctgacgctca | gtggaacgaa | 2820 |
| aactcagctt | aggggatttt | ggtcagtga | ttatcaaaaa | ggatcttcc | ctagatctac | 2880 |
| ttaaattaaa | aatgaagttt | taaatcaact | taaaagtata | atgagtaaac | ttgggtctgac | 2940 |
| agttaccat | gctttaatcag | tgaggcacct | atctcagga | tctgtctatt | ctgctcatcc | 3000 |
| atagttgctc | gactccccgt | cgtgtagata | actacgatcc | gggagggctt | accactctggc | 3060 |
| ccagtgctg | caatgatacc | gcgagaccga | cgctacgata | ctccagatct | atcagcaata | 3120 |
| aaccagccag | ccggaaggcc | cgagcgcaga | agtggtctctg | caactttatc | cgccctccatc | 3180 |
| cagcttatta | atgtgtgcag | ggaagctaga | gtaagtgttt | cgccagttaa | tagttttgcg | 3240 |
| cagcttgttg | ccatgtctac | agggactcgt | gtgtcacgct | cgctgtttgg | tatggcttca | 3300 |
| ttcagctcgc | gttcccaacg | atcaaggcga | gttacatgat | cccccattgt | gtgcaaaaaa | 3360 |
| gcgggttagct | ctctcggtcc | tcagatcgct | ctcagaagta | agttggccgc | agtgttatca | 3420 |
| ctcatggtta | tggcagcact | gcataattct | cttactgtca | tgccatccgt | aaagtgtctt | 3480 |
| ctctgtagctg | gtgagtactc | aaccaagtca | tcctgagctg | agtgtagctg | gcgaccaggt | 3540 |
| tgctcttgcc | cgcggtcaat | acgggataat | accgcgccac | atagcagaa | tttaaaaggt | 3600 |
| ctcatcatgt | gaaaacgttc | ctggggcgca | aaactctcaa | ggatctctca | cgctgttgaga | 3660 |
| tccagttcga | tgtaaccacc | tcgtgcaccc | aactgatctt | cagcatcttt | tactttcacc | 3720 |

| | | | | | | |
|-------------|------------|------------|------------|------------|------------|------|
| agcgttttctg | ggtgagcaaa | aacaggaagg | caaaatgccg | caaaaaagg | aataagggcg | 3840 |
| acacggaaat | gttgtaatac | catactcttc | ctttttcaat | attattgaag | catttatcag | 3900 |
| ggttattgtc | tcattgagcg | atacatat | gaatgtattt | agaaaaataa | acaaataggg | 3960 |
| gttccgcgca | catttccccg | aaaagtgc | | | | 3988 |

<210> 13

<211> 1260

<212> DNA

<213> Homo sapiens

<400> 13

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| cacaggaaac | agctatgacc | atgattacgc | caagctcgaa | attaaccctc | actaaaggga | 60 |
| acaaaagctg | gagctccacc | gcgggtggcg | ccgctctaga | actagtggag | ccccggggct | 120 |
| gcaggaattc | atgagagtg | ttccgctggg | taccgcgaag | agccagcttg | ctcgcataca | 180 |
| gcaggacagt | gtggtggcaa | cattgaaagc | ctcgtaccct | ggcctgcagt | ttgaaatcat | 240 |
| tgctatgtcc | accacagggg | acaagattct | tgatactgca | ctctctaaga | ttggagagaa | 300 |
| aagcctgttt | accaaggagc | ttgaacatgc | cctggagaag | aatgaagtgg | acctggttgt | 360 |
| tcactctctg | aaggacctgc | ccactgtgct | tcctcctggc | ttcaccatcg | gagccatctg | 420 |
| caagcgggaa | aacctcatg | atgctgttgt | ctttcaccca | aaatttgttg | ggaagaccct | 480 |
| agaaaccctg | ccagagaaga | gtgtggtggg | aaccagctcc | ctgcgaagag | cagcccagct | 540 |
| gcagagaaag | ttcccgcatc | tggagttcag | gagttattcg | ggaaacctca | acacccggct | 600 |
| tcggaagctg | gacgagcagc | aggagttcag | tgccatcatc | ctggcaacag | ctggcctgca | 660 |
| gcgcattggc | tgccacaacc | gggttgggca | gatcctgcac | cctgagggaat | gcattgatgc | 720 |
| tgtgtggcag | ggggcctctg | gcgtggaagt | gcgagccaag | gaccaggaca | tcttggatct | 780 |
| gggtgggtgtg | ctgcacgata | ccggaactct | gcttcgctgc | atcgctgaaa | gggccttctc | 840 |
| gaggcacctg | gaaggaggct | gcagtgtgcc | agtagccctg | catcacagcta | tgaaggatgg | 900 |
| gcaactgtac | gtgactggag | gagctctggg | tctagacggc | tcagatagca | tacaagagac | 960 |
| catgcaggct | accatccatg | tccttgccca | gcattgaagt | ggccctgagg | atgacccaca | 1020 |
| gttggttaggc | atcactgtct | gtaacattcc | acgagggccc | cagttggctg | cccagaactt | 1080 |
| gggcattcag | ctgggccaat | tgttctgtgag | caaggaggcc | aaaaacatcc | tggatgttgc | 1140 |
| acggcaattg | aacgatgccc | attaataagc | ttatcgatac | cgtcgacctc | gagggggggc | 1200 |
| ccggtaccca | attccgctca | tagtgagtcg | tattacaatt | cactggccgt | cgttttacaa | 1260 |

<210> 14

<211> 32

<212> DNA

<213> Homo sapiens

<400> 14

| | | | | |
|------------|------------|------------|----|----|
| atccatgaat | tccacgcaat | gcagccccag | tc | 32 |
|------------|------------|------------|----|----|

<210> 15

<211> 32

<212> DNA

<213> Homo sapiens

<400> 15

| | | | | |
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| agtcgtaagc | ttgcctggca | ctgtctctca | tc | 32 |
|------------|------------|------------|----|----|

<210> 16

<211> 22

<212> DNA

<213> Homo sapiens

<400> 16

| | | | |
|------------|------------|----|----|
| gtaatacgac | tcactatagg | gc | 22 |
|------------|------------|----|----|

<210> 17

<211> 22

<212> DNA

<213> Homo sapiens

<400> 17
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<210> 18
<211> 20
<212> DNA
<213> Homo sapiens

<400> 18
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<210> 19
<211> 20
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<400> 19
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<210> 20
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<400> 20
ggcttcacca tgagcatgtc 20

<210> 21
<211> 993
<212> DNA
<213> Homo sapiens

<400> 21

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| acagccacca | ccaccctcaa | tgccctccaac | ctcatctacc | ccatctttgt | cacggatgtt | 120 |
| cttgatgaca | tacagcctat | caccagcctc | ccaggagtgg | ccaggtatgg | tgtgaagcgg | 180 |
| ctggaagaga | tgctgaggcc | cttggtggaa | gagggcctac | gctgtgtctt | gatctttggc | 240 |
| gtccccagca | gagttcccaa | ggacgagcgg | ggttcgcgag | ctgactccga | ggagtcccca | 300 |
| gctattgagg | caatccatct | gttgaggaag | accttcccca | acctcttggt | ggcctgtgat | 360 |
| gtctgcctgt | gtcccctaac | ctcccattgt | cactgcgggc | tcctgagtga | aaacggagca | 420 |
| ttccgggctg | aggagagccg | ccagcggctg | gctgaggtgg | cattggcgta | tgccaaggca | 480 |
| ggatgtcagg | tggtagcccc | gtcggacatg | atggatggac | gcgtgggaagc | catcaaaagag | 540 |
| gcctgatggg | cacatggact | tggaacacag | gtatcgggtga | tgagctacag | tgccaaattt | 600 |
| gcttctctgt | tctatggccc | tttccgggat | cgagcctaagt | caagccccag | ttttggggag | 660 |
| cgccgtgctc | accagctgcc | ccctggagca | cgaggcctgg | ctctccgagc | tgtggaccgg | 720 |
| gatgtacggg | aaggagctga | catgctcatg | gtgaagccgg | gaatgcccta | cctggacatc | 780 |
| gtgcggggag | taaaggacaa | gcaccctgac | ctccctctcg | ccgtgtacca | cgctctctgga | 840 |
| gagtttgcca | tgctgtggca | tggaagccag | gccggggcat | ttgatctcaa | ggctgcgcta | 900 |
| ctggagacca | tgactgcctt | ccgcagagca | ggtgctgaca | tcacatcac | ctactacaca | 960 |
| ccgcagctgc | tgacgtggct | gaaggaggaa | tga | | | 993 |

<210> 22
<211> 330
<212> PRT
<213> Homo sapiens

<400> 22

Met Gln Pro Gln Ser Val Leu His Ser Gly Tyr Phe His Pro Leu Leu
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 Arg Ala Trp Gln Thr Ala Thr Thr Leu Asn Ala Ser Asn Leu Ile
 20 25 30
 Tyr Pro Ile Phe Val Thr Asp Val Pro Asp Asp Ile Gln Pro Ile Thr
 35 40 45
 Ser Leu Pro Gly Val Ala Arg Tyr Gly Val Lys Arg Leu Glu Glu Met
 50 55 60
 Leu Arg Pro Leu Val Glu Glu Gly Leu Arg Cys Val Leu Ile Phe Gly
 65 70 75 80
 Val Pro Ser Arg Val Pro Lys Asp-Glu Arg Gly Ser Ala Ala Asp Ser
 85 90 95
 Glu Glu Ser Pro Ala Ile Glu Ala Ile His Leu Leu Arg Lys Thr Phe
 100 105 110
 Pro Asn Leu Leu Val Ala Cys Asp Val Cys Leu Cys Pro Tyr Thr Ser
 115 120 125
 His Gly His Cys Gly Leu Leu Ser Glu Asn Gly Ala Phe Arg Ala Glu
 130 135 140
 Glu Ser Arg Gln Arg Leu Ala Glu Val Ala Leu Ala Tyr Ala Lys Ala
 145 150 155 160
 Gly Cys Gln Val Val Ala Pro Ser Asp Met Met Asp Gly Arg Val Glu
 165 170 175
 Ala Ile Lys Glu Ala Leu Met Ala His Gly Leu Gly Asn Arg Val Ser
 180 185 190
 Val Met Ser Tyr Ser Ala Lys Phe Ala Ser Cys Phe Tyr Gly Pro Phe
 195 200 205
 Arg Asp Ala Ala Lys Ser Ser Pro Ala Phe Gly Asp Arg Arg Cys Tyr
 210 215 220
 Gln Leu Pro Pro Gly Ala Arg Gly Leu Ala Leu Arg Ala Val Asp Arg
 225 230 235 240
 Asp Val Arg Glu Gly Ala Asp Met Leu Met Val Lys Pro Gly Met Pro
 245 250 255
 Tyr Leu Asp Ile Val Arg Glu Val Lys Asp Lys His Pro Asp Leu Pro
 260 265 270
 Leu Ala Val Tyr His Val Ser Gly Glu Phe Ala Met Leu Trp His Gly
 275 280 285
 Ala Gln Ala Gly Ala Phe Asp Leu Lys Ala Ala Val Leu Glu Ala Met
 290 295 300
 Thr Ala Phe Arg Arg Ala Gly Ala Asp Ile Ile Ile Thr Tyr Tyr Thr
 305 310 315 320
 Pro Gln Leu Leu Gln Trp Leu Lys Glu Glu
 325 330